[019] According to the present invention, this object is solved by the modified nucleic acid oligomer ~~according to independent claim 1~~.

1-57. (CANCELED)

58. (CURRENTLY AMENDED) A nucleic acid oligomer modified by attaching a non-intercalative catalytically redox-active moiety, ~~characterized in that~~

wherein the non-intercalative catalytically redox-active moiety is selected from the group consisting of native or modified alcohol dehydrogenase, native or modified fructose dehydrogenase, and native or modified lactate dehydrogenase~~, and native or modified peroxidases~~.

59. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein the catalytically redox-active moiety is covalently attached.

60. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein the modified nucleic acid oligomer can sequence-specifically bind single-strand DNA, RNA, or PNA.

61. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 60, wherein the modified nucleic acid oligomer is a deoxyribonucleic acid oligomer, a ribonucleic acid oligomer, or a peptide nucleic acid oligomer.

62. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein, alternatively, the catalytically redox-active moiety is covalently bound to one of the phosphoric-acid, carboxylic-acid, or amine groups, or to a sugar of the nucleic acid oligomer backbone.

63. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein, following attachment to the nucleic acid oligomer, the catalytically redox-active moiety possesses catalytic activity.

64. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein, following attachment to the nucleic acid oligomer, the catalytically redox-active moiety possesses electrocatalytic activity.

65. (PREVIOUSLY PRESENTED) The modified nucleic acid oligomer according to claim 58, wherein multiple catalytically redox-active moieties are attached to the nucleic acid oligomer.

66. (CURRENTLY AMENDED) The method of producing a modified nucleic acid oligomer ~~according to claim 58,~~comprising the steps of:

selecting a non-intercalative catalytically redox-active moiety, the non-intercalative catalytically redox-active moiety being selected from the group

consisting of native or modified alcohol dehydrogenase, native or modified fructose dehydrogenase, and native or modified lactate dehydrogenase; and

~~wherein a~~ covalently attaching the catalytically redox-active moiety ~~is covalently attached~~ to a nucleic acid oligomer.

67. (PREVIOUSLY PRESENTED) The method of producing a modified nucleic acid oligomer according to claim 66, wherein, alternatively, the nucleic acid oligomer is bound to the catalytically redox-active moiety by one or more amidations with amine or acid groups of the catalytically redox-active moiety, by one or more esterifications with alcohol or acid groups of the catalytically redox-active moiety, by thioester formation with thioalcohol or acid groups of the catalytically redox-active moiety, or by condensation of one or more amine groups of the nucleic acid oligomer with aldehyde groups of the catalytically redox-active moiety and subsequent reduction of the resultant carbon-nitrogen double bond.

68. (PREVIOUSLY PRESENTED) The method of producing a modified nucleic acid oligomer according to claim 66, wherein one or more branched or linear molecular moieties of any composition and chain length are covalently attached to the catalytically redox-active moiety and the branched or linear molecular moieties possess, alternatively, a reactive amine, hydroxyl, thiol, acid, or aldehyde group for covalent attachment to a nucleic acid oligomer.

69. (PREVIOUSLY PRESENTED) The method of producing a modified nucleic acid oligomer according to claim 68, wherein the shortest continuous link between the nucleic acid oligomer and the catalytically redox-active moiety is a branched or linear molecular moiety having a chain length of 1-20 atoms..

70. (PREVIOUSLY PRESENTED) A modified conductive surface, wherein one or more types of modified nucleic acid oligomers according to claim 58 are attached to a conductive surface.

71. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein the surface consists of a metal or a metal alloy.

72. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein the surface consists of a semiconductor.

73. (CANCELED)

74. (CANCELED)

75. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein the attachment of the modified nucleic acid oligomers to the conductive surface occurs covalently or by chemisorption or physisorption.

76. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein, alternatively, one of the phosphoric-acid, carboxylic-acid, or amine groups, or a sugar group, of the nucleic acid oligomer backbone, is attached, covalently or by chemisorption or physisorption, to the conductive surface.

77. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein, alternatively, a thiol, hydroxyl, carboxylic-acid, or amine group of a modified base of the nucleic acid oligomer is attached, covalently or by chemisorption or physisorption, to the conductive surface.

78. (PREVIOUSLY PRESENTED) The modified conductive surface according to claim 70, wherein only one type of modified nucleic acid oligomer each is attached in a spatially delimited area of the conductive surface.

79. (CURRENTLY AMENDED) ~~[[A]]~~ The method of producing a modified conductive surface ~~as defined in claim 70, wherein one or more types of modified nucleic acid oligomers are applied to a conductive surface~~ comprising the steps of:

applying one or more types of nucleic acid oligomers to a conductive surface;

selecting a non-intercalative catalytically redox-active moiety, the non-intercalative catalytically redox-active moiety being selected from the group consisting of native or modified alcohol dehydrogenase, native or modified fructose dehydrogenase, and native or modified lactate dehydrogenase; and

covalently attaching the catalytically redox-active moiety to one or more types of nucleic acid oligomers.

80. (CURRENTLY AMENDED) The method of producing a modified conductive surface according to claim 7~~[[0]]~~9, wherein one or more types of nucleic acid oligomers are applied to a conductive surface and, thereafter, a modification of the nucleic acid oligomers is carried out

81. (PREVIOUSLY PRESENTED) The method of producing a modified conductive surface according to claim 79, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are hybridized with the respective complementary

nucleic acid oligomer strand and applied to the conductive surface in the form of the double-strand hybrid.

82. (PREVIOUSLY PRESENTED) The method of producing a modified conductive surface according to claim 79, wherein the nucleic acid oligomer or the modified nucleic acid oligomer is applied to the conductive surface in the presence of further chemical compounds that are likewise attached to the conductive surface.

83. (CURRENTLY AMENDED) A method of electrochemically detecting oligomer hybridization events according to the method of claim 79 further comprising the steps of ~~as defined in claim 70 are brought into contact~~ bringing into contact one or more modified conductive surfaces with nucleic acid oligomers; and~~, subsequently, detection of the~~ detecting electrical communication between the catalytically redox-active moiety and the respective conductive surface ~~takes place~~.

84. (PREVIOUSLY PRESENTED) The method according to claim 83, wherein detection takes place by cyclic voltammetry, amperometry, potentiometry, or conductivity measurement.

85. (CURRENTLY AMENDED) The method of electrochemical detection according to claim 83, wherein electrochemical detection is initiated by adding ~~[[the]~~ a substrate to the catalytically redox-active moiety attached to the conductive surface via a nucleic acid oligomer.

86. (PREVIOUSLY PRESENTED) The method according to claim 85, wherein the addition of the substrate to the catalytically redox-active moiety attached to the conductive surface via a nucleic acid oligomer is limited to an area of the conductive surface having one or more modified nucleic acid oligomer types.